UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

January 29, 1991

MEMORANDUM

SUBJECT: Bluewater Uranium Mine Preliminary Assessment Data

FROM: Donald C. White, Chief
Field Operations Branch

TO: Stephen Luftig, Director
Environmental Response Division

Enclosed are the radionuclide and gamma survey data collected by the Emergency Response Section (ERS) preliminary assessment, conducted on November 15-16, 1990, at the Brown-Vandever and Desiderio Uranium Mine Sites, located outside of Prewitt, Navajo Nation, New Mexico. This assessment was performed at the request of the Agency for Toxic Substances and Disease Registry (ATSDR) to identify if the Sites pose any immediate adverse environmental and health hazards.

Site Background

The Navajo-Brown Vandever (N-BV) and Navajo-Desiderio (N-D) mine sites are located within the Ambrosia Lake subdistrict of the Grants Uranium Mining District. The N-BV mine site encompasses approximately 155 acres, and the N-D covers 130 acres. The sites lie within a sparsely populated agricultural area.

Several families live on both mine sites. Approximately thirty people live on the N-BV site, including children, and approximately forty people live on the N-D site. The land is primarily utilized as grazing areas for the cattle, horses, sheep and goats.

Both mine sites consist of strip mine pits, tailing piles and open vent and mine shafts. There are presently no barriers prohibiting access to these mined areas.

ATSDR issued a Health Advisory for the sites on November 21, 1990. Since then, ERS has been consulting with Greg Demspey and Colleen Petullo, Office of Air and Radiation, Las Vegas and Bill Nelson, ATSDR.

Data

Figure 1 shows the locations of the mine sites. Figure 2 shows the Brown-Vandever Mine Site and Figure 3 shows the Desiderio Mine Site. Table 1 contains the gamma survey data. Table 2 lists the radionuclide data obtained from the water and soil samples. Figure 4 divides the Brown-Vandever Mine Site into four sections which were surveyed and sampled. Figures 5-8 show the sampling locations within each section of the Brown-Vandever Mine Site. Figure 9 shows the sampling locations from the Desiderio Mine Site. Appendix A contains the results of the Radon Flux experiment conducted at the Desiderio Mine Site. Appendix B contains the heavy metal sample results. Appendix C contains the laboratory data sheets.

ERD Assistance

We are requesting ERD assistance in interpreting the radionuclide assessment data for the purpose of determining if an imminent and substantial health risk exists at either of the sites. For instance, the data reveals that nearly all of the sampling points within the mined areas appear to exceed the promulgated standard for Radium-226, which should not exceed 5 pCi/g above background within the first fifteen centimeters of soil, as outlined in 40 CFR Section 192.12. We need help in determining if the sites pose an acute (need to do a removal action) or a chronic (remedial action more appropriate) health risk. One criterion that could be used to determine if a removal action is warranted is an increased carcinogenic health risk of 1 in 10,000 or more after a two year exposure. This criterion is based on the following:

A) A risk of 1 in 10,000 is the high end of the risk range established by the NCP which requires a response action;

B) It is estimated that it would take over two years for the remedial program to be able to address these sites since neither has yet to be placed on the NPL.

It is important to select a number or criteria that can be used on more than one site since there are many similar sites in Arizona and New Mexico. Our decision is likely to set a precedent for future potential removal actions at these type of uranium mine tailing sites. In addition, ATSDR must determine what steps they must undertake in response to their Health Advisory based on what we determine to do at these sites.

I look forward to your quick response to this issue. If you have any questions concerning the data, please contact Robert Bornstein, On-Scene-Coordinator, at 415-744-2298 (FTS 484-2298).

cc: Dave Lopez, ROB

Bruce Englebert, ROB Branch Chief

TABLE 1
GAMMA RADIATION SURVEY DATA
BROWN-VANDEVER MINE SITE, NAVAJO NATION

NOVEMBER 14-15, 1990

Operator - Collen Petullo Recorder - Robert Bornstein

Instrument	ID#	Calibration date	Calibration Source
1 Ludlum 19	452663	11-08-90	Ra-226
2 Bicron	825481	10-15-90	Cs-137
3 Ludlum 12 Pancake	140830	11-08-90	Pu-239,Sr-90

Date 11/14/90 SECTION 1

Inst.	Time	Station	Ground	Waist	Comments
1 3	0900 0903	Background1	11 uR/hr 100 cpm	11 uR/hr 100 cpm	2.5 mi from site.
1 3	0908 0910	Background2	11 uR/hr 100 cpm	11 uR/hr 100 cpm	1.0 mi from site.
1	0930	Brown Home	13 uR/hr	14 uR/hr	stage area
1 2	1000 1001	Station 1	35 uR/hr 25 urem/hr	36 uR/hr 25 urem/hr	Center of dirt road
1 2	1003 1004	Station 2	130 uR/hr 70 urem/hr	135 uR/hr 60 urem/hr	near tree
1 2	1007 1008	Station 3	90 uR/hr 50 urem/hr	N/A N/A	contact on ground
1 2	1010 1011	Station 4	115 uR/hr* 75 urem/hr	100 uR/hr # 50 urem/hr	
1 2	1015 1017	Station 5	130 uR/hr 85 urem/hr	145 uR/hr 60 urem/hr	
1 2	1019 1020	Station 6	1200 uR/hr 800 urem/hr	800 uR/hr 400 urem/hr	In pit zone
1 2	1028 1033	Station 7	40 uR/hr 20 urem/hr	44 uR/hr 25 urem/hr	Away from pit area
1 2	1040 1044	Station 8	150 uR/hr 90 urem/hr	140 uR/hr 72 urem/hr	

(Table 1. Continued)

Inst.	Time	Station	Ground	Waist	Comments
1 2	1055 1057	Station 9	190 uR/hr 120 urem/hr	170 uR/hr 90 urem/hr	
1 2	1105 1108	Station 10	1250 uR/hr 750 urem/hr	800 uR/hr 350 urem/hr	open are a
1 2	1113 1115	Station 11	400 uR/hr 300 urem/hr	200 uR/hr 150 urem/hr	
1 2	1118 1120	Station 12	600 uR/hr 500 urem/hr	500 uR/hr 300 urem/hr	
1 2	1122 1124	Station 13	500 uR/hr 250 urem/hr	500 uR/hr 400 urem/hr	
1 2	1127 1128	Station 14	600 uR/hr 300 urem/hr	700 uR/hr 300 urem/hr	
1 2	1134 1136	Station 15	230 uR/hr 150 urem/hr	280 uR/hr 150 urem/hr	
1 2	1140 1141	Station 16	700 uR/hr 300 urem/hr	600 uR/hr 250 urem/hr	
1 2	1150 1151	Station 17	80 uR/hr 40 urem/hr	120 uR/hr 35 urem/hr	
1 2	1155 1156	Station 18	90 uR/hr 50 urem/hr	65 uR/hr 35 urem/hr	
1 2	1300 1303	Station 19 **SECTION 2**	700 uR/hr 450 urem/hr	600 uR/hr 350 urem/hr	
1 2	1306 1309	Station 20	900 uR/hr 650 urem/hr	800 uR/hr 500 urem/hr	on pad
1 2	1314 1315	Station 21	300 uR/hr 250 urem/hr	230 uR/hr 150 urem/hr	attic
1 2	1320 1321	Station 22	230 uR/hr 130 urem/hr	210 uR/hr 100 urem/hr	edge of pile
1 2	1330 1334	Station 23	120 uR/hr 40 urem/hr	50 uR/hr 40 urem/hr	

(Table 1. Continued)

Inst.	Time	Station	Ground	Waist	Comments
1 2	1346 1348	Station 24	220 uR/hr 120 urem/hr	220 uR/hr 110 urem/hr	
1 2	1350 1352	Station 25	500 uR/hr 250 urem/hr	400 uR/hr 175 urem/hr	
1 2	1358 1400	Station 26	300 uR/hr 170 urem/hr	300 uR/hr 170 urem/hr	
1 2	1405 1408	Station 27	250 uR/hr 150 urem/hr	200 uR/hr 150 urem/hr	
1 2	1320 1322	Station 28 SECTION 3	10 uR/hr 5 urem/hr	10 uR/hr 5 urem/hr	11/15/90
1 2	1330 1330	Station 29	N/A	13 uR/hr 10 urem/hr	at window of vent
1 2	1333 1334	Station 30	80 uR/hr 50 urem/hr	80 uR/hr 50 urem/hr	lots of stones
1 3	1337 1338	Station 31	75 uR/hr 300 uR/hr	 Lgm micro	on casing in hole
1 2	1345	Station 32	350 - 90 uR/hr on brick wall 250 - 50 urem/hr on brick wall		
1 2	1355 1400	Station 33 SECTION 4	15 uR/hr 10 urem/hr	15 uR/hr 10 urem/hr	
1 2	1405 1407	Station 34	125 uR/hr 90 urem/hr	90 uR/hr 50 urem/hr	
1 2	1410 1411	Station 35	25 uR/hr 10 urem/hr	25 uR/hr 10 urem/hr	
1 2	1415 1417	Station 36	225 uR/hr* 130 urem/hr	110 uR/hr# 70 urem/hr	on wall face
1 2	1420 1423	Station 37	600 uR/hr 300 urem/hr	600 uR/hr 300 urem/hr	dug area
1 2	1430 1433	Station 38	240 uR/hr 200 urem/hr	200 uR/hr 240 urem/hr	

(Table 1. Continued)

Inst.	Time	Station	Ground	Waist	Comments
1 2	1440 1443	Station 39	18 uR/hr 10 urem/hr	18 uR/hr 10 urem/hr	
1 2	1446 1448	Station 40	700 uR/hr 600 urem/hr	600 uR/hr 300 urem/hr	
1 2	1452 1453	Station 41	500 uR/hr* 350 urem/hr	400 uR/hr# 250 urem/hr	

* On contact with rock/tailing outcrop
\# 3 feet from contact

GAMMA RADIATION SURVEY DATA

DESIDERIO MINE SITE, NAVAJO NATION

NOVEMBER 15, 1990

Operator - Collen Petullo Recorder - Vicky Radvilla

Instrument	ID#	Calibration date	Calibration Source
1 Ludlum 19	452663	11-08-90	Ra-226
2 Bicron	8254:1	10-15-90	Cs-137
3 Ludlum 12 Pancake	140830	11-08-90	Pu-239,Sr-90

Date 11/15/90 SECTION 1

(Table 1, Continued)

Inst.	Time	Station	Ground	Waist	Comments
1 3	0825	Background1	11 uR/hr 100 cpm	11 uR/hr 100 cpm	2.5 mi from site
1 3	0830	Background2	11 uR/hr 100 cpm	11 uR/hr 100 cpm	1.0 mi from site
1 2	0855 0856	Station 1	12 uR/hr 7 urem/hr	12 uR/hr 6 urem/hr	at pond site
1 2	0857 0859	Station 2	18 uR/hr 8 urem/hr	18 uR/hr 8 urem/hr	at fense
1 2	0940 0941	Station 3	10 uR/hr 5 urem/hr	10 uR/hr 5 urem/hr	at base station
1 2	0955 0956	Station 4	20 uR/hr 7 urem/hr	24 uR/hr 7 urem/hr	large pit
1 2	1000 1001	Station 5@	90 uR/hr 50 urem/hr	75 uR/hr 40 urem/hr	pile near St. 4
1 2	1045 1046	Station 6@	135 uR/hr 75 urem/hr	120 uR/hr 60 urem/hr	
1 2	1055 1056	Station 7@	85 uR/hr 50 urem/hr	75 uR/hr 40 urem/hr	
1 2	1058 1100	Station 8	170 uR/hr 90 urem/hr	120 uR/hr 60 urem/hr	
1 2	1105	Station 9			sediment only

(Table 1. Continued) Date 11/15/90 SECTION 1

Inst.	Time	Station	Ground	Waist	Comments
1 2	1107	Station 10			sediment only
1 2	1153 1154	Station 11	55 uR/hr 30 urem/hr	55 uR/hr 30 urem/hr	
1 2	1214 1215	Station 12	900 uR/hr 400 urem/hr	400 uR/hr 250 urem/hr	near attic

@ radon flux canister area

TABLE 2
EPA ERS PRELIMINARY ASSESSMENT LABORATORY RESULTS
NAVAJO-BROWN-VANDEVER
NOVEMBER 15-16,1990

SAMPLE LOCATION	ID#	RADIONUCLIDE	RESULTS	UNITS
(WATER SAMPLES) Brown Vandever Livestock Well B-V)	W1	Ra(226)	00.8 ± 0.1	pC/l
		Ra(228)	2.0 ± 5.0	
		U(233-4)	2.0 ± 0.4	
		U(235)	00.3 ± 0.1	
		U(238)	0.4 ± 0.2	
B-V Livestock Well	W2	Ra(226)	00.2 ± 0.1	pC/l
		Ra(228)	0.0 ± 5.0	
		U(233-4)	0.5 ± 0.2	
		U(235)	00.0 ± 0.1	
		U(238)	00.0 ± 0.1	
B-V Tap Water	W3	Ra(226)	00.2 ± 0.1	pC/g
		Ra(228)	0.0 ± 5.0	
		U(233-4)	2.1 ± 0.5	
		U(235)	1.0 ± 0.3	
		U(238)	0.8 ± 0.3	
Water Line B-V	W4	Ra(226)	.1 ± 0.1	pC/l
		Ra(228)	0 ± 5	
		U(233-4)	1.4 ± 0.4	
		U(235)	0.5 ± 0.2	
		U(238)	0.5 ± 0.2	
Desiderio Stock Pond	W5	Ra(226)	.3 ± 0.1	pC/l
		Ra(228)	0 ± 5	
		U(233-4)	2.3 ± 0.4	
		U(235)	0.1 ± 0.2	
		U(238)	2.2 ± 0.2	
Desiderio Tap	W6	Ra(226)	.3 ± 0.1	pC/l
		Ra(228)	0 ± 5	
		U(233-4)	1.2 ± 0.4	
		U(235)	0.0 ± 0.2	
		U(238)	0.2 ± 0.2	
Prischod Well	W7	Ra(226)	1.0 ± 0.1	pC/l
		Ra(228)	22.0 ± 6	
		U(233-4)	130.0 ± 10	
		U(235)	3.0 ± 0.5	
		U(238)	74.0 ± 7	

(Table 2. Continued)

SOIL SAMPLES

SAMPLE LOCATION	ID#	RADIONUCLIDE	RESULTS	UNITS
BACKGROUND		Ra(226)	00.8 ± 00.1	pC/g
Road to B-V	A9	Ra(228)	0.0 ± 01.0	
		U(233-4)	0.6 ± 00.1	
		U(235)	00.0 ± 0.1	
		U(238)	000.7 ± 00.1	
Station 20	1A	Ra(226)	300.0 ± 10.0	pC/g
(Section 2)		Ra(228)	1.0 ± 01.0	dry
B-V		U(233-4)	240.0 ± 20.0	
		U(235)	13.0 ± 1.0	
		U(238)	250.0 ± 20.0	
Station 22	2A	Ra(226)	34.0 ± 3.0	pC/g
(Tailing Pile)		Ra(228)	0.0 ± 1.0	dry
Section 2		U(233-4)	25.0 ± 2.0	
B-V		U(235)	1.0 ± 0.2	
		U(238)	25.0 ± 2.0	
Station 23	3A	Ra(226)	24.0 ± 2.0	pC/g
(Drainage Area)		Ra(228)	0.0 ± 1.0	
Section 2		U(233-4)	21.0 ± 2.0	
B-V		U(235)	.8 ± 0.1	
		U(238)	20.0 ± 2.0	
Station 25	4A	Ra(226)	4.7 ± 0.5	pC/g
(Upper Drainage)		Ra(228)	0.0 ± 1.0	
Section 2		U(233-4)	3.4 ± 0.4	
B-V		U(235)	.1 ± 0.1	
		U(238)	3.5 ± 0.4	
Station 6	5A	Ra(226)	49.0 ± 5.0	pC/g
(Pebble Area)		Ra(228)	.0 ± 1.0	
Section 1		U(233-4)	24.0 ± 2.0	
B-V		U(235)	1.0 ± 0.2	
		U(238)	25.0 ± 2.0	
Station 10	6A	Ra(226)	130.0 ± 10.0	pC/g
(Strip Area)		Ra(228)	0.0 ± 1.0	
Section 1		U(233-4)	100.0 ± 20.0	
B-V		U(235)	4.7 ± 0.5	
		U(238)	100.0 ± 10.0	

(Table 2. Continued)

SAMPLING LOCATION	ID#	RADIONUCLIDE	RESULTS	UNITS
Station 11 Section 1 B-V	7A	Ra(226) Ra(228) U(233-4) U(235) U(238)	260.0 ± 10.0 1.0 ± 1.0 290.0 ± 30.0 20.0 ± 2.0 310.0 ± 30.0	pC/g
Wash Area Near B-V	8A	Ra(226) Ra(228) U(233-4) U(235) U(238)	1.9 ± 0.2 1.0 ± 1.0 1.1 ± 0.1 00.0 ± 0.1 1.1 ± 0.2	pC/g
Background For Desiderio Road to Desiderio	10A	Ra(226) Ra(228) U(233-4) U(235) U(238)	1.3 ± 0.1 0.0 ± 1.0 0.6 ± 0.1 00.0 ± 0.1 0.8 ± 0.2	pC/g
Radon Flux Area Desiderio	12A	Ra(226) Ra(228) U(233-4) U(235) U(238)	34.0 ± 3.0 0.0 ± 1.0 17.0 ± 2.0 00.7 ± 0.1 17.0 ± 0.2	pC/g
Radon Flux Area Desiderio	13A	Ra(226) Ra(228) U(233-4) U(235) U(238)	30.0 ± 3.0 0.0 ± 1.0 17.0 ± 2.0 00.0 ± 0.1 1.1 ± 0.2	pC/g
Station 11 Desiderio	14A	Ra(226) Ra(228) U(233-4) U(235) U(238)	1.8 ± 0.2 0.0 ± 0.6 0.6 ± 0.1 0.0 ± 0.1 0.7 ± 0.1	pC/g
Station 12 Desiderio	15A	Ra(226 Ra(228 U(233-4) U(235) U(238)	3.0 ± 0.3 0.0 ± 1.0 1.7 ± 0.2 0.1 ± 0.1 1.5 ± 0.1	pC/g

(Table 2. Continued)

SAMPLING LOCATION	ID#	RADIONUCLIDE	RESULTS	UNITS
Station 30 Drainage near Station 30 B-V Section 3	18A	Ra(226)	0.8 ± 0.1	pC/g
		Ra(228)	1.0 ± 1.0	
		U(233-4)	0.7 ± 0.1	
		U(235)	0.1 ± 0.1	
		U(238)	0.8 ± 0.1	
Station 36 -- On Tailing Outcrop B-V Section 3	19A	Ra(226)	20.0 ± 2.0	pC/g
		Ra(228)	0.0 ± 1.0	
		U(233-4	28.0 ± 3.0	
		U(235+	1.2 ± 0.2	
		U(238)	28.0 ± 3.0	
Duplicate of 19A	20A	Ra(226)	33.0 ± 3.0	pC/g
		Ra(228)	0.0 ± 1.0	
		U(233-4	29.0 ± 3.0	
		U(235)	1.3 ± 0.2	
		U(238)	28.0 ± 3.0	
Station 40 Section 4 B-V	21A	Ra(226)	450.0 ± 50.0	pC/g
		Ra(228)	0.0 ± 01.0	
		U(233-4)	330.0 ± 30.0	
		U(235)	29.0 ± 3.0	
		U(238)	390.0 ± 40.0	

Laboratory -- TMA Eberline
7021 Pan American Freeway, N.E.
Albuquerque, NM